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C. IRVIN MCCLELLAND
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

SHENG, TOM V

ART UNIT	PAPER NUMBER
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2629

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/679,650

Applicant(s)

TANAKA ET AL.

Examiner

Tom V. Sheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 29-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 and 29-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

Claim Objections

1. Claims 1-4 and 17 are objected to because of the following informalities:

As for claim 1, line 6, the term SR is a typo and should be SF1 instead.

As for claim 2, line 4, the term SFI should be SF1 instead.

As for claim 3, line 3, the reference term S1-Sy represents learnt signatures and does not represent learnt gestures.

As for claim 4, line 6, the reference term SF1-SF8 should be enclosed in parentheses.

As for claim 17, line 2, the reference term Gi for said signature should be Si instead.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-27 and 29-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claim 1, it is unclear whether the reference character/term S, in lines 1, 10 and 12, is used for the signature or the vector forming the signature. It would be confusing if the term S were really meant to represent both the signature and the vector.

As for claim 2, the same issue of identical reference term S, in lines 2 and 4, is used for both the signature and the vector of the gesture.

As for claim 5, it is confusing that the same reference term Gk, in lines 2 and 7, is used for both the gesture and the command.

As for claim 27, again the reference character/term S, in lines 1, 9 and 11, is used for both the signature and the vector forming the signature.

Claims 2-26 and 29-32 are dependent on claims 1 and 27 respectively.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 11-27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jorgensen et al. (US 6,720,984 B1), hereinafter Jorgensen, in view of Kiraly et al. (US 6,249,606 B1), hereinafter Kiraly.

As for claim 1 and associated claims 27 and 32, Jorgensen teaches a method of obtaining a signature (M-dimensional vector f_v) of a gesture (gesture performed by a person; fig. 1, 2, column 3 lines 3-33) produced in free space (as shown), by deriving at least one time-evolving signal (EMG signals sf each correspond to two or more spaced apart sensors 14-1 and 14-2; column 3 lines 24-33) representative of muscular activity involved in producing the gesture (each EMG signal sf is produced based on muscle

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contraction or relaxation; column 3 lines 34-43) and determining at least one value of a parameter (P_{sfi}) yielded by that signal.

Jorgensen's time evolving signal $sf(t,d,m)$ naturally defines a multi-dimensional vector based on the number of sensors, which correspond to the number of channels m . Specifically, Jorgensen teaches that the number of channels M is at least 2 ($m=1, \dots, M$; $M \geq 2$). See fig. 5, column 4, line 66 through column 5, line 12. Moreover, Jorgensen teaches that the vectors are time-indexed (d). See fig. 6, column 5, lines 20-39 and column 6, lines 12-22. That is, the vectors are time-indexed. This is different from the current invention where each dimension of its vector is defined by a time interval/sub-frame whereas for Jorgensen each dimension is defined a different channel/sensor.

Thus, Jorgensen does not teach the claim limitations, "time dividing the time-evolving signal into sub-frames, and for at least one sub-frame:

determining at least one said parameter value yielded by said time-evolving signal over at least a part of that sub-frame, and

expressing said parameter value as a component of a vector along a dimension thereof specifically allocated to that sub-frame, the resultant vector forming the signature of said gesture."

Kiraly teaches a method and system for gesture recognition. Particularly, Kiraly teaches gesture in the form of a hand or body initiated cursor movement pattern in particular directions done in particular periods of time. Kiraly teaches that the coordinate displacement information of the cursor movement pattern is sampled over a

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selected sampling frequency and therefore each coordinate is associated with a time stamp (fig. 1; column 5, lines 39-49).

Particularly, Kiraly teaches single-stroke, double-stroke, or triple-stroke gestures, with each stroke having multiple segments (fig. 10A; column 12, lines 37-46). A multi-dimensional feature vector representing a gesture is formed by adding the feature of each segment as a component of the vector (fig. 8B; column 13, lines 7-39).

One of ordinary skill in the art would recognize that the forming of a feature vector by extracting features out of segments of the stroke(s) corresponds to claimed time-evolving signal (stroke(s)), sub-frames (segments, which are time sequential), parameter value (feature of each segment), expressing as a component of a vector (feature is added to the feature vector), and resultant vector forming the signature of said gesture (the final feature vector would contain all the features as vector component and inherent represent the gesture / signature of the gesture). Further, it would be advantageous to incorporate this cursor movement gesture by means of strokes into the gesture method of Jorgensen (using only one channel), thus allowing also the use of cursor movement pattern as gesture for certain commands.

Therefore, it would have obvious to incorporate Kiraly's gesture method into Jorgensen's invention, because of the advantage of further allowing the use of cursor movement pattern as gesture for certain commands.

As for claim 2, Kiraly's use of sequential stroke(s) and corresponding segments correspond to claimed time-evolving signal that progresses to occupy successive subframes with resultant vector forming the signature.

As for claim 3, Jorgensen teaches comparing a received gesture vector with reference gesture vectors for identification and thus corresponds to claimed gesture identification mode. See fig. 9A, 9B and column 9 line 66 through column 10 line 51.

As for claim 5, Jorgensen teaches a gesture learning system by conducting tests that corresponds to claimed gesture learning mode.

As for claim 11, inherently the time interval duration under the identification mode and the learning mode need to be the same for accurate identification.

As for claim 12, the time intervals are inherently identical.

As for claim 13, inherently there is a noise threshold over which gesture capture would begin with a sequence of time partition intervals.

As for claims 14-16, any two of electrodes of either sensor 14-1 or 14-2 correspond to claimed sensors 2a and 2b (fig. 1 and 2).

As for claim 17, Jorgensen's gesture (and resulting signature, that is, a representation of the gesture) corresponds to a command or entry of a data (see Abstract).

As for claim 18-20, Jorgensen does not specifically teaches making a gesture of a trigger command as claimed. On the other hand, it would have been obvious that a trigger command such as play or stop by a simple gesture can be conceived by one of ordinary skill in the art, as this would be convenient especially for people with handicap.

As for claims 21-24, continuous command is an obvious alternative to predetermined commands as claim 20.

As for claims 25 and 26, use of the different or common muscular regions for a command are well-known methods of providing gesture.

As for claim 29-31, Jorgensen's appliance 13 worn on the arm together with transmitter 17 correspond to the claimed wearable unit and means for sending extracted command inputs.

Allowable Subject Matter

6. Claims 4 and 6-10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: none of the prior arts of record teaches the limitations

"wherein each said learnt gesture (S1-Sy) has a determined number of dimensions corresponding to a determined number of sub-frames (SF1-SF8) over which that learnt signature was obtained, wherein said decision on an identification is produced on the basis of fewer sub-frames (SF1-SF4) covered by the time-evolving signal (14) of the gesture under identification, relative to said determined number of sub-frames (SF1-SF8)" of claim 4,

"producing on the fly at least one partial signature vector (Sc) of said gesture under identification, said partial signature vector being limited by the number parameter value(s) (Psfi) currently available, and thereby having fewer dimensions than said learnt signature vectors, for at least one partial signature vector produced, determining which

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signature among said learnt signatures best matches said partial signature vector, and using the result of that determining step to produce a decision on the identification of said gesture under identification" of claim 6, and

"further comprising a step of deriving an envelope (16) yielded by said time-evolving signal (14), and wherein said parameter value (Psfi) is a parameter value of said envelope (16)" of claim 9.

Response to Arguments

8. Applicant's arguments, see page 11, line 12, through page 12, line 20, filed 9/14/2006, with respect to claims 1 and 27 have been fully considered and are persuasive. However, new rejections are provided in light of the Kiraly reference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V. Sheng whose telephone number is (571) 272-7684. The examiner can normally be reached on 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Sheng

AMR A. AWAD
SUPERVISORY PATENT EXAMINER
